EVALUATION OF A NEW PROCEDURE FOR CORRECTION OF POSTPROSTATECTOMY URINARY INCONTINENCE*

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THE purpose of this report is to present our experiences with a new procedure for the correction of post-prostatectomy urinary incontinence; and to evaluate the results following several changes and revisions since our original paper.**

I see no reason to burden you with the postulated causes of post-prostatectomy urinary incontinence, nor do I deem it essential to review all the different types of corrective procedures for this affliction. Such noted investigators as Lowsley, Marshall, Marchetti, Krantz, Uhle, Quakel, Kuss, Flaque and Beneventi have done outstanding work in both fields. For the sake of brevity, suffice it to say that in postprostatectomy urinary incontinence something has happened to the neuromuscular mechanism of continence which causes varying degrees of disparity between the resistance of the external urinary sphincter and the expulsive force of the detrusor apparatus.

In an effort to correct this disparity between the forces of expulsion and resistance, many types of ingenious procedures have been devised, such as: revision, compression, constriction and support or a combination of all four types of procedures. You are familiar with the redeeming features and the pitfalls of each and are aware that if one or all were perfect there would be no necessity for this paper and for others that will certainly follow. This report deals with yet another type of procedure in the never-ending search for a tighter dam to hold back the golden drops.

As far as I can determine after a thorough search of the literature, this is an original operation designed to kink, lengthen and compress

* Presented at a meeting of the Section on Urology at The New York Academy of Medicine, January 15, 1964.
** Berry, J. L. New procedure for correction of urinary incontinence: preliminary report. *J. Urol.* 85:771-75, 1961.

the bulbous urethra, at a point just below the urogenital diaphragm, by the implantation of an acrylic prosthesis between the bulbous urethra and the bulbocavernosus muscle. The original indication for operation was incontinence, irrespective of etiology; there were no special tests to determine suitability or to predict results. We have, however, kept accurate records which include, in addition to the routine workup, cystourethroscopy, cystometrograms, and cystourethrograms with pictures of urinary control before and after operation, hoping to accumulate data that would permit us to make conclusions and furnish criteria for proper selection of cases. I will tell you about these results in my summary. I will refresh your memories a bit by giving a short résumé of the original procedure, including a description of the modifications both of the procedure and the prosthesis.

The patient is prepared for this procedure as for any type of perineal surgery, which in our routine includes sterilization of the bowel for from 24 to 36 hours with Neomycin or Sulfasuxidine, also perineal scrubs with pHisoHex for two days previous to operation, with a close perineal shave and an application of pHisoHex the previous night. After the anesthetized patient is placed in a relaxed lithotomy position, the perineum is again scrubbed with pHisoHex and aqueous Zephiran solution and draped as for a perineal procedure. We sew a towel across the perineum just above the anus and later make a basket out of this by folding upward and clamping both ends. With the Lowsley anterior or curved tractor in place, an incision is made in the midline of the perineum, extending from a point just below the scroto-perineal junction to a point about 2 cm. above the anal margin. This incision is deepened through the skin, subcutaneous tissue, the superficial and deep layers of Colles' fascia down to Buck's fascia which covers the bulbocavernosus muscle.

Buck's fascia is then vertically incised in the midline over the entire length of the bulbocavernosus muscle and by careful sharp and blunt dissection, this muscle can be exposed bilaterally. The ischiocavernosi muscles which lie just lateral to the bulb are exposed at their origins only, along the inferior surfaces of the rami. The first change in technique occurs at this point where instead of making the transverse incision in the bulbocavernosus muscle in the distal one third, it is now made slightly proximal to the belly of the muscle or nearer the urogenital diaphragm—this I believe facilitates the whole procedure. The

second modification makes its appearance now: while developing the pouch we resect a portion of the median raphe, preserving both ends. We now develop the pouch both proximally and distally on each side of the raphe, mostly with the handle of the knife. The raphe creates a partition between the two sides of the bulbocavernosus muscle and thus acts as a stabilizing structure on which the serrated ends of the prosthesis are fitted. If this stage of the operation is accomplished with extreme care, very little, if any, bleeding will be encountered.

At this point the proper-sized prosthesis is selected. Two factors determine the choice of the prosthesis; the size of the pocket and the resilience of the bulbocavernosus muscle. The prosthesis has been modified by serrating both ends and making the center concave, so that it now straddles the median raphe and partially surrounds the bulb of the urethra in an effort to prevent side-slipping of the bulb. The median raphe, as you well know, is a strong fibrous band which attaches the posterior surface of the bulbocavernosus to the anterior surface of the corpus spongiosum. The remainder of the procedure is identical to that described in the original paper; namely, a ten-inch stainless steel multistrand wire, Number 0, is passed through each of the distal fenestrations in the prosthesis and tied in the middle making a double wire which in turn is threaded through the eye of a strong, short, curved needle. The loaded curved needle is now passed through the bulbocavernosus muscle from within outward on each side at the lowest point in the pouch and carried laterally where it passes through the ischiocavernosus muscle, even through the fascia of the inferior border of the ramus of the symphysis or through the symphysis itself, eventually emerging through the fascia of the ischiocavernosus muscle. We then carry out the same procedure on the other distal ports of the prosthesis. Only then do we remove the Lowsley tractor. We pull the distal end of the prosthesis into place by means of the wires and complete the fixation on the two posterior ports passing out through the periosteum of the ascending ramus of the ischium. We then pull the posterior part of the prosthesis into place. Then on all four corners we remove one suture from the needle's eye and take a longitudinal bite farther down in the fascia of the ischiocavernosus muscle and tie, pressing the prosthesis well against the bulb and fixing all four wires in the same manner. We close the bulbocavernosus muscle with interrupted 0 chromic catgut sutures. Buck's fascia is next coapted with the same type of closure. Colles'

fascia is approximated in a similar interrupted manner. Skin edges are sutured with a continuous suture of fine wire. A pressure dressing is applied. We catheterize intermittently; an indwelling catheter is not used and the wound is not drained.

Summary and Conclusions

Our experience with this new procedure for correction of post-prostatectomy urinary incontinence began December 17, 1958, when we implanted the first acrylic prosthesis in the male perineum. The first report was made in 1961 and was based on 11 cases with urinary incontinence regardless of etiology, which varied from radical perineal prostatectomy to neurogenic dysfunction cases. Analysis of these cases at the end of 22 months showed five good and six poor results; or 45 per cent good and 55 per cent poor. These results were not impressive; yet they were informative:

1. We learned that the procedure probably has little, if any, application in neurogenic dysfunction cases; also, that a poor result in one case of incontinence following radical perineal prostatectomy does not qualify us to express an opinion in this situation.

2. I am convinced that preoperative preparation of the bowel and the use of pHisoHex scrubs have markedly decreased our postoperative infections, the last eleven cases being closed by first intention.

3. It is obvious that acrylic is well tolerated by the perineum and that the prosthesis may be implanted several times; some of these cases were reimplanted from two to four times and I have had four prostheses in one patient at the same time.

4. Our greatest problem has been with the suture material. Black silk, cotton and nylon all frayed and wore through.

5. Monofilament wire of all sizes bent, kinked, fatigued and broke. So we changed to multistrand wire which has proved best, thus far, but this, too, fatigues and breaks in from two weeks to two years.

6. It would appear that as long as there is tension on the prosthesis, most of the cases are continent until the moorings give way, causing slack; or, if one or two wires break, the prosthesis rotates on one side or the other and the patient dribbles.

7. I have implanted only one prosthesis without guy wires because this patient had a massive bulbocavernosus muscle; he was fine for about two months and then he leaked.

8. This procedure has been successful in some instances where other procedures have failed.

9. To date, there have been no serious complications and no mortality.

10. Partial extrusion of the prosthesis due to infection necessitated removal in two cases, following which one patient became perfectly continent.

11. One patient developed a fistula of the urethra following the use of an indwelling catheter.

12. Materials other than acrylic have not been used in this series, because I believe that, in order to give a fair appraisal of any procedure, one should not jump from one stump to the other.

13. Since we began using wire for skin closure, we have encountered less superficial wound infection.

14. We have been amazed at the resistance of the corpus spongiosum urethra to sinus or fistula formation.

15. External appliances such as belts, balloons, and galluses, simply slip, slide and glide off the prosthesis, and the urine trickles on.

16. From 1958 until the present date, 41 patients have sustained the implantation and reimplantation 50 times; this includes the patients with neurogenic bladder. Of this number, 18 have had a good result, 7 have been improved and 18 have been failures.

17. Finally, this procedure is by no manner or means a panacea for postprostatectomy urinary incontinence; yet, as many of my colleagues have stated, it is a logical approach and a step in the right direction.

My personal evaluation is that, if we can find some way of keeping the sutures from breaking and cutting out, it may have considerable application.